

## New Companies for the World Market

**Helmholtz Association Funds Two Startups for Precise Software Analysis and Computer-made Realistic Visual Effects – Gründungsradar of Stifterverband Confirms KIT's Excellence in the Support of Startups: Ranking in the Top Ten**

Thanks to their excellent technologies and good market perspectives, two KIT startups will be supported under the "Helmholtz Enterprise" program. Dr. Carsten Sinz and Florian Merz develop "Tools for Precise Static Software Analysis", by means of which software errors can be found and eliminated more quickly. Anton S. Kaplanyan and Thorsten-Walter Schmidt offer a software for "physically based light transport manipulation", which may be applied in film production or architecture and product visualization. Total funding amounts to about EUR 230,000. Meanwhile, the Gründungsradar (scheme to measure an active entrepreneurial culture) of the Stifterverband has ranked KIT in the top ten of higher education institutions.

Both startups of KIT are granted funds from the Initiative and Networking Fund (IVF) of the Helmholtz Association under the "Helmholtz Enterprise" program. The funding period is one year and funding covers 50 percent of the total estimated costs of the startup. The other 50 percent will be borne by KIT. The "Helmholtz Enterprise" program is aimed at supporting startups of Helmholtz Centers, which are based on an innovative idea and promise to meet with economic success. In 2013, an external expert jury selected four startup projects for funding, two of them come from KIT.

### Tools for Precise Static Software Analysis

With increasing complexity, enhanced networking, and stricter safety requirements, it is a rather complex and highly difficult task to ensure reliability of computer systems. Static software analysis methods analyze programs by translating them into mathematical formulas. In this way, software errors can be found and eliminated more easily and rapidly. Dr. Carsten Sinz and Florian Merz work in the group "Verification Meets Algorithmics" at the KIT Institute of Theoretical Informatics and develop the static analysis tool LLBMC (Low-level Bounded Model Checker) for automatic software quality checks. Their startup project "Tools for Precise Static Software

#### Monika Landgraf Chief Press Officer

Kaiserstraße 12  
76131 Karlsruhe, Germany  
Phone: +49 721 608-47414  
Fax: +49 721 608-43658  
E-mail: [presse@kit.edu](mailto:presse@kit.edu)

#### For further information, please contact:

Margarete Lehné  
Press Officer  
Phone: +49 721 608-4 8121  
Fax: +49 721 608-4 3658  
E-mail: [margarete.lehne@kit.edu](mailto:margarete.lehne@kit.edu)

Analysis” is based on this tool. Compared to competing methods, the LLBMC is characterized by more exact mathematic modeling and higher precision. The tool uses methods similar to those applied for chip testing by nearly all big microprocessor manufacturers.

Presently, the LLBMC is a prototype. A graphic user interface does not yet exist and scalability to larger programs is limited, as extensive testing still remains to be done. LLBMC may therefore be considered a platform, on the basis of which specialized products can be realized. The technology is particularly suited for branches with high safety requirements, such as automotive manufacturing and supply, the aircraft sector, plant construction, and medical technology.

### **Physically Based Light Transport Manipulation**

The startup project “Physically Based Light Transport Manipulation in Path Space” is aimed at applications in film and TV production, architecture and product visualization as well as digital arts. In the Computer Graphics Group of the KIT Institute of Operating and Dialogue Systems (IBDS), Anton S. Kaplanyan and Torsten-Walther Schmidt have developed an innovative software for the artistic processing of illumination effects in computer-generated images. When computing photorealistic computer graphics, propagation of light is simulated physically by e.g. calculating the trajectories of virtual light particles. The new method of Kaplanyan and Schmidt allows for the processing of illumination by influencing the propagation of light through user inputs. This results in consistent and plausible illumination effects under simultaneous local control, and design specifications can be implemented easily.

This innovative approach and the software developed are particularly suited for branches focusing on high-quality image synthesis and visualization. The technology has already been presented at the two largest conferences for computer graphics and visual effects (SIGGRAPH and FMX) and used at a workshop of the Baden-Württemberg Film Academy. The prototype will need another development period of six to nine months until it will reach maturity.

### **Gründungsradar 2013 – KIT in the Top Ten**

The Gründungsradar (scheme to measure an active entrepreneurial culture) 2013 of the Stifterverband für die Deutsche Wissenschaft confirmed the excellent support of startups by KIT: 34 higher education institutions were analyzed, KIT reached place 9. “After the recent success of KIT in acquiring funding for the support of entrepre-

neurial activity, such as support from Helmholtz Enterprise now, we hope to be ranked better in the next round of the Gründungsradar.” Dr. Jens Fahrenberg, Head of the KIT Innovation Management Service Unit (IMA), says.

**Karlsruhe Institute of Technology (KIT) is a public corporation according to the legislation of the state of Baden-Württemberg. It fulfills the mission of a university and the mission of a national research center of the Helmholtz Association. Research activities focus on energy, the natural and built environment as well as on society and technology and cover the whole range extending from fundamental aspects to application. With about 9000 employees, including nearly 6000 staff members in the science and education sector, and 24000 students, KIT is one of the biggest research and education institutions in Europe. Work of KIT is based on the knowledge triangle of research, teaching, and innovation.**

This press release is available on the internet at [www.kit.edu](http://www.kit.edu).